

28. The apparatus of claim **27**, wherein the means for determining patient-specific parameters of the computational heart model based on the patient-specific anatomical model of the left and right ventricles and the patient-specific clinical data comprises:

means for simulating heart function using the computational heart model; and

means for adjusting the parameters of the computational heart model to control simulated clinical parameters resulting from the simulation of heart function using the computational heart model to match corresponding measure clinical parameters for the patient.

29. The apparatus of claim **28**, wherein the computational heart model includes a cardiac electrophysiology module, and cardiac biomechanical module, and a cardiac boundary conditions module.

30. The apparatus of claim **29**, wherein the means for simulating CRT at one or more anatomical locations using the patient-specific computational heart model comprises:

simulating heart function with the patient-specific computational heart model with a stimulated current introduced at the one or more anatomical locations in the cardiac electrophysiological module of the computational heart module.

31. A non-transitory computer readable medium storing computer program instructions for patient-specific cardiac therapy planning, the computer program instructions when executed by a processor causing the processor to perform operations comprising:

generating a patient-specific anatomical model of left and right ventricles from medical image data of a patient; generating a patient-specific computational heart model based on the patient-specific anatomical model of the left and right ventricles and patient-specific clinical data; and

simulating a cardiac therapy using the patient-specific computational heart model.

32. The non-transitory computer readable medium of claim **31**, wherein the operation of generating a patient-specific anatomical model of left and right ventricles from medical image data of a patient comprises:

detecting a patient-specific left ventricle model and a patient-specific right ventricle model in the medical image data; and

fusing the left ventricle model and the right ventricle model into a single bi-ventricular volumetric mesh.

33. The non-transitory computer readable medium of claim **31**, wherein the operation of generating a patient-

specific anatomical model of left and right ventricles from medical image data of a patient further comprises:

generating a model of fiber architecture based on the bi-ventricular volumetric mesh.

34. The non-transitory computer readable medium of claim **31**, wherein the operation of generating a patient-specific computational heart model based on the patient-specific anatomical model of the left and right ventricles and patient-specific clinical data comprises:

determining patient-specific parameters of the computational heart model based on the patient-specific anatomical model of the left and right ventricles and the patient-specific clinical data.

35. The non-transitory computer readable medium of claim **34**, wherein determining patient-specific parameters of the computational heart model based on the patient-specific anatomical model of the left and right ventricles and the patient-specific clinical data comprises:

simulating heart function using the computational heart model; and

adjusting the parameters of the computational heart model to control simulated clinical parameters resulting from the simulation of heart function using the computational heart model to match corresponding measure clinical parameters for the patient.

36. The non-transitory computer readable medium of claim **35**, wherein the computational heart model includes a cardiac electrophysiology module, and cardiac biomechanical module, and a cardiac boundary conditions module.

37. The non-transitory computer readable medium of claim **36**, wherein the operation of simulating a cardiac therapy using the patient-specific computational heart model comprises:

simulating cardiac resynchronization therapy (CRT) at one or more anatomical locations using the patient-specific computational heart model.

38. The non-transitory computer readable medium of claim **37**, wherein the simulating CRT at one or more anatomical locations using the patient-specific computational heart model comprises:

simulating heart function with the patient-specific computational heart model with a stimulated current introduced at the one or more anatomical locations in the cardiac electrophysiological module of the computational heart module.

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